IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re Patent Application of

BUTCHER et al

Serial No. 10/807,499

Filed: March 24, 2004

Title: COMPARE AND BRANCH MECHANISM
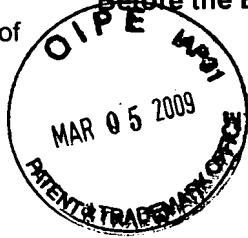
Atty Dkt. SCS-550-540
       C#   M#

Confirmation No. 4256

TC/A.U.: 2183

Examiner: A. Li

Date: March 5, 2009

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

☐ **Correspondence Address Indication Form Attached.**

☐ **NOTICE OF APPEAL**
Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner twice/finally rejecting applicant's claim(s). $540.00 (1401)/$270.00 (2401) $

☐ An appeal **BRIEF** is attached in the pending appeal of the above-identified application $540.00 (1402)/$270.00 (2402) $

☐ Credit for fees paid in prior appeal without decision on merits   -$ (   )

☒ A reply brief is attached.   **(no fee)**

☐ Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s)
    One Month Extension $130.00 (1251)/$65.00 (2251)
    Two Month Extensions $490.00 (1252)/$245.00 (2252)
    Three Month Extensions $1110.00 (1253/$555.00 (2253)
    Four Month Extensions $1730.00 (1254/$865.00 (2254) $

☐ "Small entity" statement attached.

Less   month extension previously paid on   -$(   )

TOTAL FEE ENCLOSED $ 0.00

☐ **CREDIT CARD PAYMENT FORM ATTACHED.**

Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any <u>deficiency</u>, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140.**

901 North Glebe Road, 11th Floor
Arlington, Virginia 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100
SCS:kmm

NIXON & VANDERHYE P.C.
By Atty: Stanley C. Spooner, Reg. No. 27,393

Signature: _____

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re Patent Application of

BUTCHER et al   Atty. Ref.: SCS-550-540

Serial No. 10/807,499   TC/A.U.: 2183

Filed: March 24, 2004   Examiner: A. Li

For: COMPARE AND BRANCH MECHANISM

*   *   *   *   *   *   *   *   *   *   *

March 5, 2009

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

REPLY BRIEF

This Reply Brief is responsive to the Examiner's Answer mailed January 7, 2009.

The bulk of the Examiner's Answer is identical to the previously filed Final Rejection

and therefore is fully responded to by Appellants' Appeal Brief filed July 21, 2008 and

therefore there is no need to further rebut these allegations.

However, beginning on page 15, section 10 entitled "Response to Argument," the

Examiner purportedly responds to various issues and alleged Examiner errors discussed

in the Appeal Brief and therefore these will be rebutted directly.

**Error #1. The Examiner misunderstands the Hennessy and
Ishizaki references and the fact that their combination would
not result in the claimed "copying," "determining" and
"branching" structures and method steps**

As was pointed out in Section B beginning on page 10 of the Appeal Brief, the

Hennessy reference fails to teach the claimed "copying" and "determining" structures and

steps. Appellants point out that in the Hennessy reference the program counter value is

copied to an exception counter and is "not in response to a comparison result (as required

by the claimed 'comparison' in Appellants' claim 1). Instead, Hennessy copies in

response to an exception" (Appeal Brief, page 11, lines 3-4). Because the Examiner does

not dispute this statement, Appellants will treat it as an admission that both this was a

correct statement with respect to the Hennessy reference and that there is no disclosure of

the "copying" step as recited in the claims.

The Examiner avoids the issue and instead argues that the missing "copying"

structure and step is somehow disclosed in Ishizaki. It is possible that the Examiner's

error in logic comes from the fact that Hennessy and Ishizaki teach two different types of

"exceptions." In Hennessy, "exceptions" and "interrupts" are defined as "events **other**

than branches or jumps that change the normal flow of instruction execution" (emphasis

added, see Hennessy, page 410, section 5.6, line 4). In as much as this is specifically

defined in Hennessy, the Examiner and the PTO are saddled with this definition.

The Examiner admits on page 16 of the Examiner's Answer that "Ishizaki has

taught that an exception is a **conditional branch**" (emphasis added). In view of the two

contrary definitions of the word "exception," the Examiner should have recognized that

the "exceptions" discussed in the Hennessy reference are different events with respect to the "exceptions" disclosed in the Ishizaki reference. The Examiner's error in understanding is perhaps the confusion relating to the same term "exception" being used to identify different things in the Hennessy and Ishizaki references.

The Examiner's error in understanding is perhaps compounded by the fact that given the different meanings of "exceptions," any modification of the Ishizaki reference to incorporate features from the Hennessy reference would result in a system having additional functionality for detecting and responding to events **other than** branches or jumps. However, it would not affect Ishizaki's response to conditional branches since the Hennessy reference limits itself to discussing the response to non-branch events. Since Hennessy "copies" program counter in response to an "exception" as defined in the Hennessy reference (meaning a "non-branch event"), then when this feature is included in the system of Ishizaki, the program counter value must also be copied in response to a non-branch event (given the definition of "exception" in Ishizaki).

Thus, the combined Hennessy/Ishizaki system would not have the features of Applicants' independent claims, i.e., as in the claim 1 "copying" step ("copying, in dependence upon a result of said comparison, a program counter value to a third register") or the "determining" step ("determining a target branch address from a pre-programmed stored value and said program counter value") or the "branching" step ("branching to a sub-routine at said target branch address in dependence upon a result of said comparison") (emphasis added to the quoted claim 1 language in each of the three quotes).

Even if one combined the features disclosed in the Hennessy and Ishizaki references as suggested by the Examiner, because of the different meaning of the word "exception" in both Hennessy and in Ishizaki, one could not arrive at any one of the three structures or method steps set out in Appellants' claim 1 or other dependent claims, i.e., "copying," "determining" or "branching." As a consequence, the Examiner has not met her burden of establishing that any of these three steps are disclosed in the Ishizaki/Hennessy combination.

Moreover, as noted in Section A of Appellants' Appeal Brief, the Examiner has admitted that these steps are not present in the Ishizaki reference. Because Appellants have shown that the Hennessy reference fails to teach the "copying" and "determining" steps and because the Examiner has admitted that Ishizaki fails to teaching the "copying", "determining" and "branching" steps, even if those references are combined, they cannot teach Appellants' claimed structures/method steps. Therefore, the Examiner has failed to cure the defective *prima facie* case of obviousness noted in the Appeal Brief.

**Error #2. The Examiner misrepresents the teachings of
Assembly Programming, Schmidt and Wikipedia**

On page 16, lines 14-16 of the Examiner's Answer, the Examiner "notes that secondary references, such as Assembly Programming, Schmidt or Wikipedia were provided to show that the steps of copying and determining are readily known in the art and common practice." This statement is again believed to be incorrect.

1447074

A review of the Final Rejection will show that Assembly Programming, Schmidt and Wikipedia were provided to show features that have nothing to do with the basic "copying" and "determining" steps/structures disclosed in Appellants' independent claims. For example, pages 10-12 of the Final Official Action show that Assembly Programming was cited only against dependent claims 6, 18, 30 and 42. The Schmidt reference was cited against only dependent claims 8, 20, 32 and 44. The Wikipedia reference was cited only against dependent claims 12, 24, 36 and 48. There is no allegation by the Examiner anywhere that any of these three references show Appellants' independent claim structures or steps of "copying, in dependence upon a result of said comparison, a program counter value to a third register" or "determining a target branch address from a pre-programmed stored value and said program counter value" as recited in Appellants' claims.

The Examiner is respectfully requested to identify any portion of the Final Rejection which alleges that any of these three secondary references were provided to show that the basic steps of "copying" or "determining" were known in the art. The absence of such identification evidences the fact that the Examiner is simply for the first time attempting to allege that the features (which are either admittedly or demonstrably shown to be missing from the Ishizaki and Hennessy combination) are somehow disclosed in the Assembly Programming, Schmidt or Wikipedia references but provides no supporting evidence of record.

As a consequence, the Examiner's new point of argument that the "Assembly Programming, Schmidt or Wikipedia" references were previously provided to show that

1447074

the steps of copying and determining are readily known in the art and common practice is misinformation provided to the Board, is simply erroneous and not supported by any evidence of record in this application.

Error #3. The Examiner's belated suggestion of motivation for combining references is not relevant to the teaching in Ishizaki

On page 16, six lines from the bottom, the Examiner addresses "Applicants' second argument on pages 12 and 16-17" of the Appeal Brief, i.e., Section D, "[t]he Examiner fails to provide any reason or motivation for combining references." The Examiner does not dispute that the relatively recent Supreme Court case in *KSR* indicates that mere conclusory statements do not meet the requirement of "some articulated reasoning with some rationale underpinning to support the legal conclusion of obviousness." Appellants' Brief pointed out that the Examiner had failed to provide any "articulated reasoning" with any rational underpinning to support the conclusion of obviousness on page 7 of the Final Rejection.

On page 17 of the Examiner's Answer, the Examiner now suggests that the motivation to include features of Hennessy in the system of Ishizaki is to "ensure the exception handler takes the appropriate action to report and correct the error and restart program execution when the exception is handled." However, as noted above, the Ishizaki and Hennessy references mean different things when they use the term "exception" and thus there would be no reason to combine the references.

Moreover, Ishizaki has a mechanism for ensuring that the exception handler takes the appropriate action. Ishizaki states at column 3, lines 19-21, column 4, lines 18-20 and column 5, lines 51-57, that the type of exception that has occurred (and hence the exception handling routine that will be used) is determined by examining the bit pattern of the tw/twi instruction that triggered the conditional branch. Since Ishizaki already has a mechanism for determining which exception handler to use, there is no need to "ensure the exception handler takes the appropriate action" as contended by the Examiner. As a result, it cannot be obvious to include the feature relating to the determination of a target branch address using the program counter as claimed in the system of Ishizaki (it being unlikely that this feature could do anything to ensure that program execution is restarted).

Thus, the Examiner's belated suggestion that there is some "articulated reasoning with some rational underpinning" presented in the Examiner's Answer meeting the Supreme Court's requirement is not only defective (for the reasons noted), but simply does not meet the test to establish a *prima facie* case of obviousness.

Error #4. The Examiner does not respond to the Appeal Brief Section F with respect to Ishizaki teaching away from the claimed invention

On page 18, first full paragraph of the Examiner's Answer, the Examiner alleges that Ishizaki does not clearly teach away from the "copying" and "branching" steps. However, Section F of Appellants' Brief refers to the "copying" and "**determining**" steps. Not only does the Examiner fail to appreciate the different meanings of "exception" in the Ishizaki and Hennessy references, she ignores the fact that Appellants

have alleged that Ishizaki teaches away from the claimed "**determining**" step. She

apparently fails to appreciate that Ishizaki teaches that the cause of the conditional branch

(and hence the appropriate exception handling routine) is determined by examining the

instruction that gave rise to the branch and decoding the bit pattern of that instruction.

This feature of Ishizaki is central to the operation of the Ishizaki device and thus it clearly

teaches away from the feature of the present invention, i.e., where the target branch

address is determined from "a pre-programmed stored value and said program counter

value."

Thus, the Examiner fails to rebut the evidence, and argument based on evidence,

as set out in the Appeal Brief Section F, i.e., that the Ishizaki reference would lead one of

ordinary skill in the art away from Appellants' claimed combination of elements. As

noted in the Brief, such teaching away legally rebuts any *prima facie* case of obviousness

made by the Examiner based upon the Ishizaki reference by itself or in combination.

Error #5. The Examiner ignores the argument in Section G of the Appeal Brief that the Ishizaki and Hennessy references are mutually incompatible

Firstly, it is noted that the Examiner does not respond to the "inherent

incompatibility" argument contained in the second full paragraph under Section G on

page 14 of the Appeal Brief.

This inherent incompatibility is because the "exceptions" defined in Hennessy are

different events than the "exceptions" defined in Ishizaki (as noted above, in Hennessy

the exceptions are **other than branches**, while in Ishizaki the exceptions are **branches**).

Thus, from this paragraph alone, unrebutted by the Examiner, it is clear that the Ishizaki and Hennessy references are incompatible.

Appellants' Appeal Brief notes that the Examiner's only response in the previous actions to this observation by the Appellants is to allege that the Hennessy quote was "taken out of context" but she provides no evidence of record supporting her position. Appellants pointed out that the Examiner's Final Rejection does admit that Hennessy's exception is "an unexpected event from within the processor" and that this is compatible with Appellants' position that Hennessy relates to **CPU exceptions** and not Ishizaki's **software exceptions**.

It is noted that the Examiner has finally agreed that Appellants' observations regarding MIPS **not** being a software language (when in fact it is a RISC architecture) (see Examiner's Answer, page 19, lines 14-15) is correct. The Examiner attempts to gloss over her misunderstanding of the terminology by arguing that each architecture has an instruction set and each instruction set is a software language. While this may or may not be true (there is no evidence of record supporting the Examiner's position), the fact is, the Examiner made a material misstatement in her prior assertion that **MIPS is a software language**. This fact buttresses the other facts demonstrating the Examiner's misunderstanding of the claim language and the two primary references, Ishizaki and Hennessy.

In Section G of the Appeal Brief, Appellants also noted that Ishizaki related to the handling of **software exceptions** while the Hennessy reference related to the handling of **CPU exceptions**. However, on page 19, line 3 of the Examiner's Answer, the Examiner

- 9 -

now contends that "Hennessy relates to software exceptions" since purportedly the operating system analyzes and deals with its exceptions. However, the Examiner is again confusing the **exception handling** performed by the operating system with the **exception** itself. These two things are totally different.

An "exception" in Hennessy is an event that requires some action to be performed, while "exception handling" is the action performed when an "exception" occurs. Because the operating system of Hennessy deals with exceptions, it is clearly responsible for the exception handling. However, the operating system (OS) is not the "exception" itself and so the fact that the operating system is software **does not mean that the exception handling by the operating system is a software exception.**

In fact, as explained on page 410 of the Hennessy reference, the operating system processes unexpected events from within the processor, **other than branches or jumps,** which are defined as part of the microprocessor architecture. This, as would be clearly understood by those of ordinary skill in the art, is a **CPU exception**, and not a **software exception.**

In view of the discussion on page 19, the Examiner has simply failed to rebut the evidence of record which clearly establishes that the Ishizaki and Hennessy references are inherently incompatible, which incompatibility stems from the difference in definition of "exception" which the Examiner apparently still fails to recognize.

Error #6. The Examiner apparently misunderstands the argument presented in Section G of the Appeal Brief

In the "Fourth" argument on page 19 of the Examiner's Answer, the Examiner states that "Applicants' arguments seem to be suggesting that Ishizaki and Hennessy are incompatible because Ishizaki is for software while Hennessy is for hardware, i.e. CPU."

However, this is not what is clearly stated on page 14 of the Appeal Brief. Appellants pointed out in the first sentence under the heading that "Ishizaki and Hennessy relate to the handling of two very different types of exceptions." That the Examiner apparently fails to appreciate that "exception" is defined differently in the Ishizaki and Hennessy references has been clearly demonstrated by the evidence of record. Thus, the distinction is not that one reference is related to hardware and the other reference is related to software, but that the two references handle different types of exceptions (by definition).

The inclusion of features relating to the handling of one kind of exception would not affect the method of handling the other type of exception. This argument applies equally to two different kinds of software exceptions or two different kinds of CPU exceptions. The argument is that the features of Hennessy included in the system of Ishizaki would result in Ishizaki being able to handle an additional type of exception, i.e., CPU exceptions, which by definition are events **other than branches**, but would not affect the existing mechanism in Ishizaki for handling software exceptions (defined as **branch events**). Thus, the Examiner clearly misunderstands the arguments made in the Appeal Brief.

1447074

SUMMARY

The crux of the Examiner's misunderstanding is that in the Hennessy reference "exceptions" are events **other than** branches (as stated on page 10, section 5.6, line 4), but, as the Examiner admits on page 16 of the Examiner's Answer, in Ishizaki an exception is a "**conditional branch**." The fact that exception means two different things in the two different references and that the Examiner fails to appreciate this difference has apparently led the Examiner to misunderstand what the references teach and why they would not be combinable and to disregard the fact that they actually teach away from the claimed invention.

As a result of the Examiner's misunderstandings, she has failed to establish a *prima facie* basis for obviousness because the combination of the two references does not disclose Appellants' independent claims. Moreover, the Examiner has failed to supplement the Final Rejection and provide any "articulated reasoning with some rationale underpinning" for picking and choosing elements from the two references and then combining them in the manner disclosed only in Appellants' claims.

Moreover, even if the Examiner had met her burden of proving that the prior art discloses the claim features and had provided the Supreme Court required "analysis," any *prima facie* case of obviousness is legally rebutted by the evidence of record from the two primary references that they teach away from the claimed invention.

As a result of the above, there is simply no support for the rejection of Appellants' independent claims or claims dependent thereon under 35 USC §103. Thus, and in view
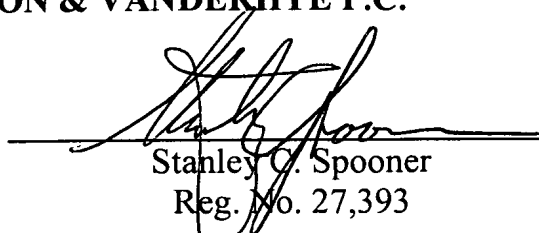
of the above, the rejection of claims 1-48 under 35 USC §103 is clearly in error and

reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____
Stanley C. Spooner
Reg. No. 27,393

SCS:kmm
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

1447074